

# Ultrasonography for Diagnosis, Intervention, and Follow-up in Juvenile Idiopathic Arthritis

Akademisk avhandling

Som för avläggande av medicine doktorsexamen vid Sahlgrenska akademien vid Göteborgs universitet kommer att offentligen försvaras i föreläsningssal Tallen på Drottning Silvias barn- och ungdomssjukhus, Göteborg, onsdagen 14 december 2011 kl 13.00.

av  
Louise Laurell

Fakultetsopponent  
Professor Taunton Southwood, University of Birmingham, Birmingham, England

## Avhandlingen baseras på följande arbeten:

- I. Louise Laurell, Michel Court-Payen, Susan Nielsen, Marek Zak, Mikael Boesen, Anders Fasth. Ultrasonography and color Doppler in juvenile idiopathic arthritis: diagnosis and follow-up of ultrasound-guided steroid injection in the ankle region. A descriptive interventional study. *Pediatric Rheumatology* 2011, 9(4): 1–11.
- II. Louise Laurell, Michel Court-Payen, Susan Nielsen, Marek Zak, Carsten Thomsen, Maribel Miguel-Pérez, Anders Fasth. Ultrasonography and color Doppler of proximal gluteal enthesitis in juvenile idiopathic arthritis: a descriptive study. *Pediatric Rheumatology* 2011, 9(22): 1–13.
- III. Louise Laurell, Michel Court-Payen, Susan Nielsen, Marek Zak, Anders Fasth. Ultrasonography and color Doppler in juvenile idiopathic arthritis: Diagnosis and follow-up of ultrasound-guided steroid injection in the wrist region. A descriptive interventional study. Submitted for publication.
- IV. Louise Laurell, Michel Court-Payen, Susan Nielsen, Marek Zak, Mikael Boesen, Anders Fasth. Comparison of ultrasonography with Doppler and MRI for assessment of disease activity in juvenile idiopathic arthritis: a pilot study. Submitted for publication.

Göteborg 2011



UNIVERSITY OF GOTHENBURG

# **Ultrasonography for Diagnosis, Intervention, and Follow-up in Juvenile Idiopathic Arthritis**

**Louise Laurell**

Institute of Clinical Sciences, Department of Pediatrics, Sahlgrenska Academy,  
University of Gothenburg, Gothenburg, Sweden

## **Abstract**

Early therapeutic intervention and the use of novel, highly effective treatments in juvenile idiopathic arthritis (JIA) have improved the outcome in many diseased children, but have also increased the need for more precise methods for evaluating disease activity. In this context, both ultrasonography (US) and magnetic resonance imaging (MRI) play an important role in adult rheumatology, although these methods have yet not been fully evaluated in JIA.

The objective of the present research was to evaluate Doppler-US in the clinical setting of pediatric rheumatology. This was achieved by investigating the following:

- Doppler-US for identification of the exact anatomical locations of inflamed structures in clinically affected ankle and wrist regions
- US for guidance of steroid injections in the ankle and wrist regions
- Doppler-US for follow-up of treatment efficacy after steroid injections
- Doppler-US and MRI for diagnosis of deep-seated gluteal enthesitis, including a comparison of the results with those obtained in healthy age- and sex-matched controls
- Doppler-US and MRI for evaluation of symptomatic joints in JIA patients, including a comparison of the results with those found in healthy age- and sex-matched controls

The findings of the current studies indicate that use of Doppler-US/US in pediatric rheumatology:

- enables identification of the exact anatomical location of inflammation in the ankle and wrist regions;
- improves assessment of synovitis and enthesitis;
- allows precise guidance of steroid injections in the ankle and wrist regions;
- is valuable for repetitive monitoring of treatment efficacy;
- is readily available at point of care and, in anatomically accessible areas, is complementary to MRI for investigation of disease activity and damage.

**Keywords:** ultrasonography, color Doppler, juvenile idiopathic arthritis, symptomatic ankles and wrists, synovitis, enthesitis, US-guided steroid injection, follow-up, MRI.

ISBN 978-91-628-8367-6  
Lund, 2011, Media-tryck